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A REASSESSMENT OF THE TAXONOMIC STATUS OF SOME NEOTROPICAL HYLID FROGS

By

WILLIAM E. DUELLMAN¹

In the course of research directed towards the completion of a checklist of the frogs of the family Hylidae, I have concluded that several taxonomic changes are necessitated by new data and re-evaluation of older material. These taxonomic changes and their justifications are the subject of this paper (Table 1).

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AL-MNRJ	Adolpho Lutz Collection, Museu Nacional Rio de Janeiro
AMNH	American Museum of Natural History
ANSP	Academy of Natural Sciences of Philadelphia
BMNH	British Museum (Natural History)
FSM	Florida State Museum
KU	University of Kansas Museum of Natural History
LSU	Louisiana State University, Museum of Zoology

¹ Curator, Division of Herpetology, Museum of Natural History, and Professor, Department of Systematics and Ecology, The University of Kansas, Lawrence, Kansas 66045.

TABLE 1. Alphabetical list of taxonomic changes.

Trivial Name, Original Generic Name, Author, Date	Current Name
<i>bogerti</i> (<i>Hyla</i>), Cochran and Goin, 1970	<i>Hyla carnifex</i>
<i>bufona</i> (<i>Gastrotheca</i>), Cochran and Goin, 1970	<i>Gastrotheca weinlandii</i>
<i>capitocarinata</i> (<i>Hyla</i>), Andersson, 1945	<i>Gastrotheca longipes</i>
<i>carnea</i> (<i>Hylella</i>), Cope, 1868	<i>Sphaenorhynchus carneus</i>
<i>charlesbogerti</i> (<i>Hyla</i>), Goin, 1970	<i>Hyla carnifex</i>
<i>favosa</i> (<i>Hyla</i>), Cope, 1886	<i>Hyla favosa</i>
<i>febrigi</i> (<i>Hyla</i>), Ahl, 1927	<i>Hyla acuminata</i>
<i>habra</i> (<i>Sphoerohyla</i>), Goin, 1957	<i>Sphaenorhynchus carneus</i>
<i>hobbsi</i> (<i>Hyla</i>), Cochran and Goin, 1970	<i>Hyla punctata</i>
<i>imitator</i> (<i>Paludicola</i>), Barbour and Dunn, 1921	<i>Hyla imitator</i>
<i>inornata</i> (<i>Hyla</i>), Lutz, 1973	<i>Hyla granosa</i>
<i>langsdorffii</i> (<i>Hyla</i>), Duméril and Bibron, 1841	<i>Osteocephalus langsdorffii</i>
<i>laynei</i> (<i>Hyla</i>), Goin, 1957	<i>Hyla triangulum</i>
<i>leali</i> (<i>Hyla</i>), Bokermann, 1964	<i>Hyla rossalleni</i>
<i>mcembranacca</i> (<i>Hyla</i>), Andersson, 1945	<i>Hyla triangulum</i>
<i>meridiana</i> (<i>Hyla misera</i>), Lutz, 1954	<i>Hyla microcephala meridiana</i>
<i>mimetica</i> (<i>Hyla</i>), Melin, 1941	<i>Hyla triangulum</i>
<i>nigra</i> (<i>Hyla</i>), Cope, 1887	<i>Hyla x-signata nasica</i>
<i>oliveae</i> (<i>Hyla</i>), Cochran and Goin, 1970	<i>Hyla triangulum</i>
<i>pusilla</i> (<i>Hyla</i>), Melin, 1941	<i>Gastrotheca weinlandii</i>
<i>reticulata</i> (<i>Hyla</i>), Jiménez de la Espada, 1871	<i>Hyla triangulum</i>
<i>rubcola</i> (<i>Hyla</i>), Cochran and Goin, 1970	<i>Hyla punctata</i>
<i>rubracyla</i> (<i>Hyla</i>), Cochran and Goin, 1970	<i>Hyla rubracyla</i>
<i>rubro-lineata</i> (<i>Hyla punctata</i>), Lutz, 1951	<i>Hyla punctata</i>
<i>triangulum</i> (<i>Hyla</i>), Günther, 1869	<i>Hyla triangulum</i>
<i>viridis</i> (<i>Gastrotheca</i>), Lutz and Lutz, 1939	<i>Gastrotheca viridis</i>
<i>viviparum</i> (<i>Nototrema</i>), Andersson, 1945	<i>Gastrotheca testudinea</i>
<i>werneri</i> (<i>Hyla</i>), Cochran, 1952	<i>Hyla microcephala werneri</i>

MCSN	Museo Civica Storia Natural, Genoa
MCZ	Museum of Comparative Zoology
MLS	Museo La Salle, Bogotá
MNCN	Museo Nacional de Ciencias Naturales, Madrid
MNHN	Museum National d'Histoire Naturelle, Paris
NHMG	Naturhistoriska Museet, Göteborg
NHMW	Naturhistorisches Museum, Wien
NHRM	Naturhistoriska Rijksmuseum, Stockholm
UMMZ	University of Michigan Museum of Zoology
USNM	United States National Museum (=National Museum of Natural History)
WCAB	Werner C. A. Bokermann, São Paulo
ZMB	Zoologisches Museum, Berlin
ZSM	Zoologisches Sammlung, München

Gastrotheca longipes (Boulenger)

Nototrema longipes Boulenger, 1882:418 [Syntypes.—BMNH 1947.2.31.4 from Canelos and 1947.2.31.5 from Sarayacu, both Provincia Pastaza, Ecuador; Buckley collector].

Hyla capitocarinata Andersson, 1945:75 [Holotype.—NHRM 1959 from the Río Pastaza watershed, presumably Provincia Pastaza, Ecuador; William Clarke MacIntyre collector]. New synonym.

The best preserved syntype of *G. longipes* is a male (BMNH 1947.2.31.5) having a snout-vent length of 55.9 mm; the other syntype (BMNH 1947.2.31.4) is a female having a snout-vent length of 82.3 mm. The latter specimen is faded and somewhat desiccated; nevertheless, the structural characters and faint color pattern are the same as those of the male. Both specimens are characterized by a broad well-ossified, exostosed skull with a well-developed temporal arcade. The lips are thin and slightly flared. In dorsal view the snout is broadly rounded; in lateral profile it is anteriorly inclined. The skin on the dorsum is smooth except for a row of tubercles on the supratympanic fold. The thumb is equal to the second finger in length. The fourth finger is webbed to the base of the penultimate phalange; the fourth toe is webbed to the base of the penultimate phalange, and the other toes are webbed to the bases of the discs. The hind limbs are long and slender; the ratios of tibia length to snout-vent length in the male and female are, respectively, 0.597 and 0.617, and the ratios of foot length to snout-vent length are 0.432 and 0.442.

The coloration is evident only in the male, which has a creamy tan dorsum with a brown interorbital bar and five small brown spots on the dorsum. A narrow interrupted white line on the margin of the upper lip is slightly expanded below the eye. There is a narrow white stripe above the anus and along the outer edge of the forearm and foot. Below the white line on the foot the outer part of the foot and the outer two toes are dark brown. The brown outer toes contrast with the creamy tan inner three toes and are distinctive feature of this species.

The holotype of *Hyla capitocarinata* (NHRM 1959) is a male having a snout-vent length of 55.0 mm. The ratios of tibia length and foot length to snout-vent length are, respectively, 0.593 and 0.425. The specimen is badly formalin burned and desiccated. Nevertheless, most important structural features are evident. The characteristics of the head, hands, and feet are identical to those of the syntypes of *Gastrotheca longipes*. Despite the formalin darkened coloration, the outer edge of the foot and the outer two toes are noticeably darker than the rest of the dorsum.

The complete agreement of visible morphological characters and the identical coloration of the feet of the holotype of *Hyla capitocarinata* with the syntypes of *Gastrotheca longipes* necessitates the synonymy of the two names.

Goin (1964) placed *Gastrotheca viridis* Lutz and Lutz, 1939, in the synonymy of *G. longipes*. However, Goin overlooked the coloration of the feet, which in *G. viridis* lack the dark outer edges and toes characteristic of *G. longipes*. Furthermore, *G. viridis* is known only from the Serra do Mar in southeastern Brasil, whereas *G. longipes* occurs in the upper Amazon Basin of Ecuador and Perú. I conclude that *G. viridis* is a species distinct from *G. longipes*.

Gastrotheca testudinea (Jiménez de la Espada)

Nototrema testudineum Jiménez de la Espada, 1871:62 [Holotype.—MNCN 155 from San José de Moti, Provincia Napo, Ecuador; Marcos Jiménez de la Espada collector].

Nototrema viviparum Andersson, 1945:82 [Syntypes.—NHRM 1964 (10 specimens) from Baños, Provincia Tungurahua, Ecuador; William Clarke-MacIntyre collector]. New synonym.

The holotype of *Gastrotheca testudinea* is a female having a snout-vent length of 76.6 mm. The snout is round in dorsal view and anteroventrally inclined in profile. The skull is exostosed. The skin on the dorsum is thickened and leathery, and there is a thin transverse occipital fold (artifact of preservation[?]). The discs on the fingers are large, equal to the diameter of the tympanum. The thumb is slightly shorter than the second finger. The fingers are webbed basally. A distinct inner tarsal fold extends the entire length of the tarsus, and the elliptical, inner metatarsal tubercle is not visible from above. The fourth toe is webbed to the base of the antepenultimate phalange, and the other toes are webbed to the bases of the penultimate phalanges. The ratio of tibia length to snout-vent length is 0.504 and of foot length to snout-vent length, 0.444. The dentigerous processes of the prevomers are transverse ridges between the choanae and bear 11-11 teeth.

The specimen is badly faded. The head, throat, and limbs are pale cream, and the dorsum and belly are pale reddish brown with no pattern except for a fine cream reticulate network on the dorsum and one small rectangular white spot middorsally in the sacral region. The groin and distal posterior surfaces of the thighs are dark brown.

Tags are missing from some of the frogs comprising the type series of *Gastrotheca vivipara*. Detailed data were taken on one female having a snout-vent length of 62.5 mm with a tag labelled "Baños." The snout is round in dorsal view and round above and inclined anteroventrally in profile. The skull is exostosed. The skin on the dorsum is smooth. The discs on the fingers are large, equal to the diameter of the tympanum. The thumb is slightly shorter than the second finger, and the fingers are webbed basally. A distinct tarsal fold extends the entire length of the tarsus, and the elliptical, inner metatarsal tubercle is barely visible from above. The fourth toe is webbed to the base of the antepenultimate phalange, and the other toes are webbed to the bases of the penultimate phalanges. The ratio of tibia length to snout-vent length is 0.530 and of foot length to snout-vent length, 0.456. The dentigerous processes of the prevomers are transverse ridges between the posterior margins of the choanae and bear 10-11 teeth.

The dorsum is tan with brown mottling tending to form irregular transverse bars on the back and limbs. The axilla, groin, and

posterior surfaces of the thighs are dark brown, and the anterior surfaces of the thighs are brown with darker brown mottling. The throat and ventral surfaces of the thighs are grayish brown, and the belly is tan.

The type specimens of the two nominal species are alike in all essential morphological features. The type of *G. testudinea* appears to have been partially desiccated and nearly completely faded, but traces of dark brown persist in protected areas in the groin and on the posterior surfaces of the thighs. In the absence of significant differences, I consider *G. vivipara* to be a synonym of *G. testudinea*.

Because the tags are no longer attached to some of the specimens of *G. vivipara*, it is not possible to discern which individuals originally were labelled as "Cerro Tungurahua" and "Río Pastaza watershed." It is probable that all of the specimens came from the Río Pastaza valley below Baños, rather than at Baños at an elevation of 1800 m, where the highland *G. riobambae* occurs. I have examined the specimen of *G. testudinea* reported by Boulenger (1882: 417) from Pozuzu, Perú. It and other specimens from "Carretera a Pucallpa," Perú and from Mera, Ecuador, are representatives of an undescribed species being studied by Charles F. Walker.

In addition to the type specimens of *G. vivipara* and *G. testudinea*, I have examined two other specimens referable to *G. testudinea* (LSU 26016-7 from between Tambo and Valle de Apurímac, Departamento Ayacucho, Perú).

Gastrotheca weinlandii (Steindachner)

Nototrema weinlandii Steindachner, 1892:837 [Holotype.—NHMW 16481 from "Ecuador"; collector unknown].

Hyla pusilla Melin, 1941:28 [Holotype.—NHMG 472 from Roque, Departamento San Martín, Perú; Douglas Melin collector]. New synonym.

Gastrotheca bufona Cochran and Goin, 1970:164 [Holotype.—MLS 344 from Ventanas, about 50 km (by road) northwest of Yarumal, Departamento Antioquia, Colombia; Nicéforo María collector]. New synonym.

Gastrotheca weinlandii is a large, long-legged frog with a casqued, co-ossified cranium and a distinctive color pattern of a narrow dark brown middorsal stripe and transverse dark marks on the body and limbs. The snout is high, and the tympanum is about twice as high as long. Large triangular calcars are present in adults. In the holotype the calcars are folded flat against the heels; Steindachner (1892:837) overlooked the calcars, and they were not shown in the accompanying illustration. Examination of the holotype of *Hyla pusilla* reveals that it is a juvenile 19.6 mm in snout-vent length. The color pattern, although formalin-darkened, is the same as that in *G. weinlandii*. The arrangement of subarticular tubercles, the webbing between the fingers, and the shape of the tympani are the same. Allowing for ontogenetic changes in cranial co-ossification, the heads are essentially the same. Thus, I conclude

that the holotype of *Hyla pusilla* is a juvenile of *Gastrotheca weinlandii*.

Steindachner's oversight of the calcears on the type of *Gastrotheca weinlandii* resulted in Cochran and Goin (1970:164) not comparing their unique specimen of *Gastrotheca bufona* with *G. weinlandii*. Cochran and Goin's (1970, Fig. 9) illustration of the holotype of *G. bufona*, an adult male 55.3 mm in snout-vent length, shows a color pattern like that of *G. weinlandii*. The structural features described by Cochran and Goin are like those of specimens of *G. weinlandii* that I have examined. It is apparent that *G. bufona* is a junior synonym of *G. weinlandii*, a species known from montane forests in northern Colombia and the eastern slopes of the Andes in Ecuador and Perú.

Hyla acuminata Cope

Hyla acuminata Cope, 1862:354 [Syntypes.—USNM 5843, 102700 from "Paraguay"; T. J. Page collector].

Hyla phrynomerma Boulenger, 1889:248 [Syntypes.—BMNH 1947.2.12.78-79 from Colonia Resistencia, Departamento Chaco, Argentina; Charles Spazzini collector].

Hyla fiebrigi Ahl, 1927:223 [Lectotype.—NHMW 20018:2 from "Brasil"; Fiebrig collector]. New synonym.

Hyla acuminata—Lutz, 1973:132 [Synonymized *Hyla phrynomerma*].

Ahl's (1927) description of *Hyla fiebrigi* was overlooked by Lutz (1973). Ahl (1927:223) listed four specimens obtained by Fiebrig in Brasil, with no further documentation of locality or catalogue numbers of specimens. Ahl did state that the new species resembled *Hyla phrynomerma* Boulenger and *Hyla nasica* Cope.

One specimen in the Naturhistorisches Museum in Vienna bears labels "20018:2," "*Hyla fiebrigi* Type." The other three specimens cannot be found; thus, I designate NHMW 20018:2 as the lectotype of *Hyla fiebrigi* Ahl. The specimen, a female, has a snout-vent length of 45.6 mm (Fig. 1). The granular dorsum, large truncate discs, shape of the head, and color pattern, especially the labial bars and mottling on the posterior surfaces of the thighs are like those characters in *Hyla acuminata*. Comparison of data taken on the types of *Hyla acuminata*, *H. fiebrigi*, and *H. phrynomerma* indicates that there are no distinctive morphological differences among the three named taxa. Thus, I concur with Lutz (1973:132) that *Hyla phrynomerma* Boulenger is a junior synonym of *Hyla acuminata* Cope and also place *Hyla fiebrigi* Ahl as a junior synonym of *Hyla acuminata*, a species inhabiting the Chacoan region of northern Argentina, Paraguay, and southern Mato Grosso, Brasil.

Hyla balzani Boulenger

Hyla balzani Boulenger, 1898:132 [Holotype.—MCSN 28872 from "Yungas Province (1600 m.)," Bolivia].



FIG. 1. Dorsal view of lectotype of *Hyla fiebrigi*.

This species has been known only from the type specimen from an indefinite locality, presumably on the eastern slopes of the Andes in Bolivia. A series of specimens (LSU 25992-26015) from San José, Río Santa Rosa, 1000 m., Departamento Ayaencho, Perú, provides the first distributional information on this species.

Hyla carnifex Duellman

Hyla carnifex Duellman, 1969:242 [Holotype.—KU 117993 from Tandapi, 1460 m., Provincia Pichincha, Ecuador; John D. Lynch collector].

Hyla bogerti Cochran and Goin, 1970:261 [Holotype.—USNM 118731 from Medellín, Departamento Antioquia, Colombia; Nicéforo María collector]. New synonym.

Hyla charlesbogerti Goin, 1970:788 [Substitute name for *Hyla bogerti* Cochran and Goin]. New synonym.

The unfortunate multiplicity of names for a small montane hylid in northwestern South America is the result of names proposed while Cochran and Goin's (1970) manuscript was in press. Straughan and Wright (1969) named *Hyla bogertae* from México. Upon the publication of *Hyla bogerti* (Cochran and Goin, 1970), Goin (1970) felt compelled to propose a substitute name (*Hyla charlesbogerti*) for the Colombian frog. The substitute name was unnecessary because the trivial names are patronyms for two different persons and differ in spelling; thus, they are not homonyms. Duellman (1969) named *Hyla carnifex* from Ecuador. Subsequent study of living and preserved specimens from Ecuador and Colombia revealed that only one species is involved; the earliest name is *Hyla carnifex* Duellman.

It is now evident that *Hyla carnifex* is not a member of the *Hyla parviceps* group as originally proposed by Duellman (see Duellman and Crump, 1974); rather it can be associated with *Hyla columbiana* Boettger and *Hyla variabilis* Boulenger. *Hyla carnifex* inhabits the Cordillera Occidental of the Andes in Ecuador and Colombia, where it extends northward at least to central Antioquia.

***Hyla granosa* Boulenger**

Hyla granosa Boulenger, 1882:358 [Syntypes.—BMNH 1947.2.12.93 from Demerara Falls, Guyana; 1947.2.12.94-96 from Santarém, Pará, Brasil; 1947.2.12.97-98 from "Interior of Brasil"; 1947.2.12.99 from Canelos, Provincia Pastaza, Ecuador, herein designated as lectotype].

Hyla ornatissima Noble, 1923:291 [Holotype.—AMNH 13491 from Meamu, Mazaruni River, Guyana; William Beebe collector].

Hyla granosa gracilis Melin, 1941:21 [Syntypes.—NHMG 467 (2 specimens), from Rio Uaupés (north of Ipanoré), Amazonas, Brasil; Douglas Melin collector].

Hyla granosa—Rivero, 1971:181 [Synonymized *Hyla ornatissima* Noble and *Hyla granosa gracilis* Melin].

Hyla inornata Lutz, 1973:70 [*Nomen nudum*]. New synonym.

I have seen many living individuals from Ecuador, Perú, and Brasil and have examined series of preserved specimens from throughout the Amazon Basin and Guianas. I concur with Rivero (1971:181) in the placement of *H. granosa gracilis* Melin and *H. ornatissima* in the synonymy of *H. granosa*. Cochran and Goin (1970:222) considered *H. granosa gracilis* to be a synonym of *H. punctata* Schneider, a species having posterolaterally inclined or gently arched dentigerous processes of the prevomers and lacking projecting prepollical spines in adult males. The type specimens of *H. granosa* and *H. granosa gracilis* have angular dentigerous processes and projecting prepollical spines.

Dorsal dark spots and an interorbital bar are present in some specimens from throughout the range. Noble's (1923:291) type of *Hyla ornatissima* is a patterned juvenile. Lutz (1973:70) suggested the possibility that the patterned and plain frogs might be separate species and proposed the name *Hyla inornata* (*nomen nudum*) for the plain frogs. Evidence from data secured on coloration, mating calls, and tadpoles from populations in Amazonian Ecuador demonstrate that only one species is involved. Mating calls from the Guianas and Belém, Brasil, are like those from Ecuador.

***Hyla imitator* (Barbour and Dunn)**

New Combination

Paludicola imitator Barbour and Dunn, 1921:160 [Holotype.—MCZ 345 from Lake Cudajaz (=Lagôa Codajás), Amazonas, Brasil; George Seeva collector].

Parker (1927:452) suggested that the unique type probably was a *Hyla*. I have examined the specimen and agree that it is a hylid frog. The specimen is an adult female containing pigmented eggs and having a snout-vent length of 30.5 mm. The snout is rounded dorsally and in profile; the tympanum is higher than long, its length being 48.5 percent of the diameter of the eye. The subarticular tubercles are conical. Webbing is absent on the hand; the web extends to the base of the antepenultimate phalange on the fourth toe and to the bases of the penultimate phalanges on the other toes. A

ridge-like tarsal fold extends the entire length of the tarsus, terminating at an elliptical inner metatarsal tubercle. The skin on the dorsum is thick with scattered tubercles; the skin on the belly is granular. The anus is covered with a sheath opening ventrally at the level of the ventral surfaces of the thighs. The dentigerous processes of the prevomers are transverse elevations between the posterior margins of round choanae; each process bears two teeth.

The dorsum is dull reddish brown. There is a dark brown triangular mark on the occiput with anterolateral corners on the eyelids; two brown transverse bars are present on each thigh and shank. The upper lip is cream. A dark brown mark extends posteriorly from the eye, encompasses the tympanum, and terminates above the insertion of the arm. One small dark brown spot is present in the axilla, and two are in the groin. The hidden surfaces of the limbs and the venter are creamy tan.

This enigmatic specimen is unlike any other frog I have seen from South America. The nature of the skin on the dorsum is reminiscent of that of juvenile *Phrynohyas*, but other characters, principally the webbing and anal sheath, contradict such an association; furthermore, the specimen is a gravid female and far too small to be a sexually mature *Phrynohyas*. Parker (1927-452) suggested that the specimen was allied with *Hyla eximia* from México. That association is negated by the tubercular skin and the anal sheath. Thus, although *imitator* certainly is a hylid, it is not possible on the basis of present knowledge of hylid frogs to determine its relationships.

Hyla microcephala Cope

Hyla microcephala Cope, 1886:281 [Syntypes.—USNM 13473 (2 specimens, now lost) from Chiriquí, Panamá; J. A. McNeil collector].

Fouquette (1968:322) demonstrated that *Hyla misera* Werner of the Venezuelan llanos is conspecific with *H. microcephala* Cope of northern coastal South America and Central America. Although Lutz (1973:214) referred to Fouquette's conclusions, she used *misera* in a specific sense and recognized two subspecies in addition to the nominate race. Because Lutz presented no evidence for specific distinctness of *misera* from *microcephala*, good taxonomic practice necessitates a rearrangement of the subspecific names. Accordingly, the subspecies of *Hyla microcephala* now recognized are:

Hyla microcephala microcephala Cope, 1886.

Hyla microcephala meridiana Lutz, 1954 (New combination).

Hyla microcephala misera Werner, 1903.

Hyla microcephala underwoodi Boulenger, 1889.

Hyla microcephala werneri Cochran, 1952 (New combination).

Hyla picturata Boulenger

Hyla picturata Boulenger, 1899:276 [Holotype.—BMNH 1947.2.13.35 from Paramba, Provincia Imbabura, Ecuador; W. H. F. Rosenberg collector].

This species has not been reported in the literature since the type description, except for the inclusion of the name in checklists. I have now examined 34 specimens from the Pacific lowlands of southern Colombia (Cauca and Nariño) and northwestern Ecuador (Esmeraldas, Imbabura, Los Ríos, and Pichincha). All specimens have the distinctive color pattern illustrated by Boulenger (1899, pl. 12, fig. 3).

Hyla punctata (Schneider)

Calamita punctatus Schneider, 1799:170 [Syntypes.—NHRM 155 (2 specimens) from "Surinam"; collector unknown].

Hyla punctata—Daudin, 1802:41.

Hyla papillaris Spix, 1824:34 [Holotype.—formerly in ZSM (lost) from Eca, Tefé, Amazonas, Brasil; J. B. de Spix collector].

Hyla variolosa Spix, 1824:34 [Holotype.—formerly ZSM 2496/0 (lost) from Rio Amazonas, Brasil; J. B. de Spix collector].

Hyla rhodoporus Günther, 1869:488 [Holotype.—BMNH 1947.2.23.5 from "Upper Amazon"; Mr. Bartlett collector].

Hyla punctata—Peters, 1872:208, 214 [Synonymized *Hyla papillaris* Spix, *Hyla variolosa* Spix, *Hyla rhodoporus* Günther].

Hylella pearsei Ruthven, 1922:57 [Holotype.—UMMZ 54639 from Fundación, Departamento Magdalena, Colombia; A. S. Pearse collector].

Hyla punctata rubro-lineata B. Lutz, 1951:307 [Syntypes.—AL-MNRJ 4698-9 from Buena Vista, Departamento Santa Cruz, Bolivia; José Steinbach collector]. New synonym.

Hyla punctata—Cochran and Goin, 1970:222 [In part; synonymized *Hylella pearsei* Ruthven].

Hyla rubeola Cochran and Goin, 1970:225 [Holotype.—USNM 152751 from Serranía de Macarena, Departamento Meta, Colombia; Federico Medem collector]. New synonym.

Hyla hobbsi Cochran and Goin, 1970:311 [Holotype.—MCZ 28052 from Caño Guacayá, a tributary of the Río Apaporis, Comisaría Amazonas, Colombia; collector unknown]. New synonym.

Hyla punctata is a highly variable, but predominately green frog found throughout the middle and upper Amazon Basin and in the Guianas and Trinidad. At night it has prominent red dorsolateral stripes, bordered below by white stripes, and red dorsal spots; by day the dark markings are diffuse, restricted to minute red-brown flecks, or absent. As is evident from the foregoing synonymy, many names have been proposed for this frog. Peters (1872:208, 214) placed Spix's *H. papillaris* and *H. variolosa* and Günther's *H. rhodoporus* in the synonymy of *H. punctata*, but Cochran and Goin (1970) recognized *H. rhodoporus* as distinct from *H. punctata*. Furthermore, Cochran and Goin (1970) named *H. rubeola* and *H. hobbsi* from Colombia. Examination of the types of all of these taxa, except those named by Spix, the types of which were destroyed

in World War II, leads me to the conclusion that they all are representatives of one species.

Two specimens (NHRM 155) are noted as types of *Calamita punctata* Schneider; it is also noted: "Two of Linne's types of *Rana arborea* from Mus[eum] Ad[olph]i Frid[erici] [1754]." Both specimens are females having snout-vent lengths of 34.2 and 34.3 mm, and are in remarkably good condition. Faint dorsolateral light stripes and dorsal flecks are evident. The holotype of *Hyla rhodoporus* (BMNH 1947.2.23.5) is a soft, faded female with no color pattern evident. The holotype of *Hyla rubeola* (USNM 152751) is a badly desiccated female; Cochran and Goin (1970:226) noted that the freshly preserved specimen had "brilliant red dorsolateral stripes and . . . dorsal surfaces flecked with bright red. . ." The holotype of *Hyla hobbsi* (MCZ 28052) is a somewhat desiccated female. The specimen is faded but has evident dark dorsolateral stripes bordered below by light stripes, and dorsal flecks. Evidently the specimen was preserved in strong alcohol, causing shrinkage which resulted in the skin folding dorsolaterally above the tympanum and the arm; this fold was interpreted as a glandular fold by Cochran and Goin (1970:311), who placed *H. hobbsi* in its own group, separate from other Colombian *Hyla*.

Cochran and Goin (1970) distinguished three species (*rubeola*, *rhodoporus*, and *punctata*) in the *Hyla punctata* group in Amazonian Colombia on the basis of relative tympanum size, extent of finger webbing, extent of dentigerous processes of the prevomers, and the presence or absence of red flecks or stripes. Metachromatic variation accounts for the supposed differences in color pattern. Comparison of data on the types of the nominal taxa under consideration with a series of specimens from one locality reveals that the range of variation among the types is nearly encompassed within one series from Amazonian Ecuador (Table 2). Thus, I have been

TABLE 2. Comparison of holotypes of four species with *Hyla punctata* from Amazonian Ecuador.
(All data are for females)

Sample	Snout-vent Length	Tympanum/ Eye	Finger Webbing	Prevomerine Teeth
<i>H. hobbsi</i>	42.4	40.0	II2-3III3-2½IV	24
Holotype				
<i>H. rhodoporus</i>	37.1	70.0	II2½-3½III3-2½IV	13
Holotype				
<i>H. rubeola</i>	32.5	60.0	II2*-3*III3-2*IV	9*
Holotype				
<i>H. punctata</i>	31.2-34.3	58.1	II2-3III3-2½IV	15
2 Syntypes				
<i>H. punctata</i>	31.0-41.7	51.7-71.6	II(2-2½)-(3-3½)III	13-23
20 ♀ - Ecuador	(\bar{x} =36.9)	(\bar{x} =63.2)	(3-3½)-(2-2½)IV	(\bar{x} =19.2)

unable to discern any morphological characters in either living or preserved specimens to warrant the recognition of *H. hobbsi*, *H. rhodoporus*, or *H. rubeola*, and I consider all of these names to be junior synonyms of *H. punctata*.

Lutz (1951:307) proposed that populations of *Hyla punctata* from eastern Bolivia were different from northern populations and provided the subspecific epithet *H. p. rubrolineata* for specimens from Buena Vista, Bolivia. Subsequently, Barrio (1965:109) referred Argentinean specimens to *H. p. rubrolineata*. Comparison of freshly preserved specimens from Bolivia, Perú, Ecuador, and Colombia reveals no consistent differences in coloration, and I do not consider *rubrolineata* to be a valid subspecies.

Cochran and Goin (1970:224) synonymized *Hylella pearsei* Ruthven with *Hyla punctata*; their only statement regarding this action was: "We also examined the type of *Hylella pearsei* Ruthven (MZUM 54639), and it appears to be an immature specimen of *H. punctata*." I have examined the unique type specimen and agree that it is a juvenile, but I am not convinced that it is the same as *H. punctata*. My skepticism stems from the zoogeographic enigma caused by such an arrangement, for *Hylella pearsei* was named from the lower slopes of the Sierra de Santa Marta in northern Colombia, across the Andes from the nearest known populations of *Hyla punctata*. Until the species is rediscovered in the Sierra de Santa Marta, *Hylella pearsei* may just as well remain secluded in the synonymy of *Hyla punctata*.

Hyla rossalleni Goin

Hyla alleni Goin (non Cope, 1870), 1957a:60 [Holotype.—FSM 8501 from Leticia, Comisaría Amazonas, Colombia; J. N. Layne and E. R. Allen collectors].

Hyla rossalleni Goin, 1959:340 (substitute name for *Hyla alleni*).

Hyla leali Bokermann, 1964:3 [Holotype.—WCAB 10397 from Forte Principe da Beira, Rondônia, Brasil; Werner C. A. Bokermann collector]. New synonym.

I have examined the holotype and paratype of *H. rossalleni* and paratopotypes of *H. leali* and compared the latter with specimens from the upper Amazon Basin in Bolivia, Perú, and Ecuador. This small yellowish tan frog has irregular brown dashes on the dorsum; some individuals have faint pale cream spots on the eyelids, but this may be the result of metachrosis or an artifact of preservation. Comparison of the types reveals no differences in structure or in coloration; thus, I conclude that the types represent the same species.

Neither on the basis of external structure nor on cranial osteology does *H. rossalleni* belong in the *Hyla leucophyllata* group, where it was placed by Cochran and Goin (1970:299). Until the mating call and tadpoles are known, the relationships probably will remain obscure.

***Hyla rubracyla* Cochran and Goin**

Hyla rubracyla Cochran and Goin, 1970:229 [Holotype.—USNM 157820 from Rio Calima, near Córdoba, Departamento Valle, Colombia; Federico Medem and Coleman J. Goin collectors].

Hyla pellucens—Duellman (in part), 1971:221.

Duellman (1971:221) regarded the two specimens named *H. rubracyla* by Cochran and Goin to be color variants of *H. pellucens* Werner. In February 1971 Charles W. Myers found calling males and adult females of two green species of *Hyla* in a swamp forest, 2 km above Playa del Oro, upper Río San Juan, Chocó, Colombia. Examination of these specimens (AMNH 87174-86) reveals that some are *H. pellucens*, and others are assignable to *H. rubracyla* (Fig. 2).

The following color notes are from Myer's field catalogue: "CWM 10392-4. *Hyla rubracyla*. Light green, densely punctated

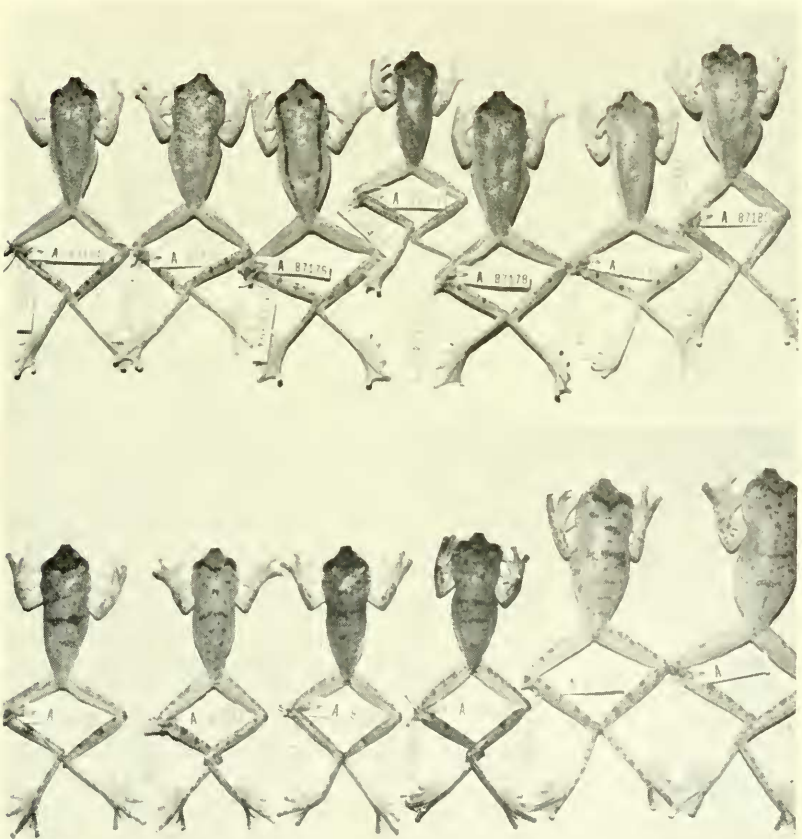


FIG. 2. Variation in dorsal color pattern of *Hyla rubracyla* (upper row) and *Hyla pellucens* (lower row).

with grayish pigment dots and with a sprinkling of red dots. There is a tendency for a weak, cream dorsolateral line, which may be partly obscured by darker pigment. There is a streak of dark red-brown pigment on the canthus rostralis and upper eyelid, and in the large ♀ this continues strongly along the dorsolateral line of the back, but in the ♂ ♂ is nearly absent on the back. Rear thighs pale greenish flesh. Several black spots atop each shank. Ventral surfaces uniformly pale blue, except for a median white stripe on the bellies of the ♂ ♂ that has to do with underlying mesentary. In the ♂ ♂, the iris is pale gray, or, in proper light, pale pink. The iris of the female has a suffusion of blackish gray and shows little pink reflection. Webs of hands and feet not pigmented. Bones not green."

As presently known, the range of *Hyla rubracyla* is in southern Chocó to Valle on the wet Pacific lowlands of Colombia. The range is encompassed completely by that of *H. pelluceus*, which extends to southern Ecuador.

Hyla tuberculosa Boulenger

Hyla tuberculosa Boulenger, 1882:355 [Holotype.—BMNH 1947.2.13.34 from Canelos, Provincia Pastaza, Ecuador; Mr. Buckley collector].

This large tree frog with tubercular skin and fully webbed feet and nearly fully webbed hands has not been reported since the original description. I have seen four additional specimens from Chicherota and Río Villano, Provincia Pastaza, Ecuador; mouth of the Río Santiago, Departamento Amazonas, Perú; and Río Uaupés at junction of Rio Querari, Amazonas, Brasil.

The largest female is the holotype, 68.5 mm in snout-vent length; the largest male (AMNH 43479) is from Perú and has a snout-vent length of 83.6 mm and nuptial excrecences on an elongate prepollex. A juvenile male (USNM 193866) is from Brasil and has a snout-vent length of 46.5 mm; it was obtained on 13 January 1967 from "a stem several inches above water along side stream." All specimens are like the holotype in having a tuberculate dorsum and a row of pointed tubercles on the outer edge of the forearm and foot. All are tan with irregular, narrow, dark brown markings, which tend to form a crude reticulate pattern in USNM 193866; narrow brown transverse bars are present on the limbs.

Hyla x-signata nasica Cope

Hyla nasica Cope, 1862:354 [Syntypes.—USNM 5835, 32371 from "Paraguay"; T. J. Page collector].

Hyla granulata Peters, 1871:651 [Holotype.—Formerly in ZMB, now lost; collector unknown].

Hyla nasica—Boulenger, 1882:376 [Synonymized *Hyla granulata* with *Hyla nasica*].

Hyla nigra Cope, 1887:41 [Holotype.—ANSP 11269 from Chapada, Mato Grosso, Brasil; H. H. Smith collector]. New synonym.

Hyla rubra nasica—Gans, 1960:301.

Hyla x-signata nasica—B. Lutz, 1973:143.

Examination of the types of *Hyla nasica* and *H. nigra* reveals that the three specimens are alike in size, structure, and remaining color pattern. The types of both nominal species have protruding, subacuminate snouts; subtruncate discs on the fingers, bifid palmar tubercles; outer fingers basally webbed; and webbing vestigial between first and second toes.

Lutz (1973:144) noted that *Hyla x-signata nasica* is widely distributed in the Chacoan region of northern Argentina, Paraguay, and Mato Grosso, Brasil; the type locality of *H. nigra* is within the known range of *H. x. nasica*. Another species in the *Hyla rubra* complex, *H. acuminata* Cope, also occurs at Chapada, Mato Grosso. *Hyla acuminata* has tubercular skin dorsally, whereas *H. nasica* has smooth skin.

THE HYLAEUCOPHYLLATA GROUP

With the exclusion of *Hyla rossalleni* from the *Hyla leucophyllata* group, as defined by Cochran and Goin (1970:289), there are nine species currently recognized in the group; six other names are junior synonyms. The results of studies in the field, examination of large series of specimens, and close scrutiny of extant type specimens are indicative of the existence of only six species, five of which are sympatric in the upper Amazon Basin and one of which, *H. ebraccata* Cope occurs in Middle America and was reviewed by Duellman (1970).

Of the five species in the upper Amazon Basin, I have examined large series of adult frogs and have studied tadpoles and analyzed recordings of the calls of all except *H. favosa*, of which tadpoles and recordings are not available. Comparative measurements and proportions of adult males are given in table 3 and comparisons of mating calls are given in table 4.

Hyla bifurca Andersson

Hyla (Hylella) bifurca Andersson, 1945:17 [Holotype.—NHM 1962 from Río Pastaza, Provincia Pastaza, Ecuador; Rolf Blomberg collector].

The holotype is an adult female 29.9 mm in snout-vent length. This is the smallest species in the group; males attain snout-vent lengths of only 25.7 mm. The dorsum is dark brown, usually with small black punctations mid-dorsally. A broad, inverted U-shaped pale cream mark covers the top of the snout and edges of the eyelids and extends posteriorly as a pair of broad dorsolateral stripes to the sacral region. A small cream spot is present on each heel and above the vent. The webbing, flanks, and hidden surfaces of the thighs are dull orange-brown.

TABLE 3. Comparison of sizes and proportions of species of the *Hyla leucophyllata* group from Santa Cecilia, Ecuador.
(All data for males; mean and standard deviation below range)

Species	N	Snout-vent Length	Tibia Length/ SVL	Foot Length/ SVL	Head Length/ SVL	Tympanum/ Eye
<i>H. bifurca</i>	20	22.9-25.7 24.25±0.779	0.486-0.544 0.522±0.014	0.428-0.498 0.460±0.022	0.297-0.348 0.323±0.013	0.333-0.536 0.428±0.048
<i>H. favosa</i>	8	30.6-36.0 33.11±1.742	0.510-0.534 0.521±0.009	0.457-0.483 0.462±0.012	0.318-0.343 0.332±0.011	0.410-0.529 0.449±0.041
<i>H. leucophyllata</i>	25	29.8-34.9 33.19±1.226	0.489-0.538 0.514±0.014	0.438-0.492 0.459±0.014	0.297-0.330 0.316±0.008	0.405-0.543 0.484±0.037
<i>H. sarajacensis</i>	25	24.7-27.5 26.06±0.976	0.494-0.566 0.531±0.020	0.452-0.510 0.478±0.017	0.306-0.333 0.315±0.008	0.371-0.517 0.446±0.039
<i>H. triangulum</i>	25	23.7-27.6 25.40±0.911	0.473-0.542 0.499±0.017	0.408-0.471 0.438±0.015	0.315-0.346 0.322±0.009	0.394-0.500 0.451±0.033

TABLE 4. Comparison of mating calls of four species in the *Hyla leucophyllata* group in Amazonian Ecuador.

(N = individuals/calls; means given below observed ranges)

Species	N	Note Repetition Rate	Pulse Rate (secs)	Har- monics	Fundamental Frequency (Hz)	Dominant Frequency (Hz)
<i>H. bifuca</i>	9/24	15.3-73.2 (33.9)	100-120 (105.0)	2-3 (2.8)	2625-3339 (2984.1)	2625-3339 (2984.1)
<i>H. leucophyllata</i>	9/23	17.1-120.0 (77.9)	100-180 (118.3)	3	1913-2522 (2304.2)	1913-2522 (2304.2)
<i>H. sarayaccunsis</i>	8/22	22.2-33.3 (27.0)	60-80 (74.5)	3	2826-3391 (2982.5)	2826-3391 (2982.5)
<i>H. triangulum</i> ..	4/12	12.0-31.6 (21.8)	160-180 (176.0)	7-8 (7.5)	411-625 (512.2)	1875-2680 (2298.8)

Hyla bifurca occurs in the upper Amazon Basin in southern Colombia, Ecuador, and Perú; it ascends the lower slopes of the Andes to elevations of 1400 m.

Hyla favosa Cope

Hyla favosa Cope, 1886a:95 [Holotype: ANSP 11398 from Pebas, Departamento Loreto, Perú; John Hauxwell collector].

Cochran and Goin (1970:306) placed *H. favosa* in the synonymy of *H. reticulata* Jiménez de la Espada. Study of the type specimens and living animals reveals that *H. favosa* is not conspecific with *H. reticulata*. The holotype of *H. favosa* is an adult male having a snout-vent length of 35.5 mm, only slightly smaller than the largest of eight males from Santa Cecilia, Ecuador (36.0). The dorsum is chocolate brown with a fine network of creamy white lines on the dorsal surfaces of the head, body, and limbs and on the sides of the head and body. The webbing, lower flanks, and hidden surfaces of the limbs are orange. *Hyla favosa* differs from *H. reticulata* (herein treated as a synonym of *H. triangulum* Günther) by being larger and having proportionately longer legs and feet (Table 3). The dorsal coloration of *H. reticulata* consists of many brown spots narrowly separated by creamy tan; the flash colors (webbing and hidden surfaces of the limbs) are pink at night and red by day.

In size, proportions, structure, and flash colors, *H. favosa* is most like *H. leucophyllata* (Bereis). In light of the pattern polymorphism displayed by *H. triangulum*, it is conceivable that *H. favosa* is a color morph of *H. leucophyllata*. However, in the absence of individuals with intermediate patterns and lack of data on tadpoles and mating calls of *H. favosa*, I prefer to recognize *H. favosa* as a distinct species.

Hyla favosa is known from few specimens from scattered localities in northeastern Bolivia, eastern Perú and Ecuador, and western Brasil.

Hyla leucophyllata (Bereis)

- Rana leucophyllata* Beireis, 1783:182 [Holotype.—NHRM 157 from "Surinam"; collector unknown].
- Rana variegata* Bonnaterre, 1789:8 (non Linnaeus, 1758) [Holotype, type locality, and collector unknown].
- Calamita leucophyllata*—Schneider, 1799:168.
- Hyla frontalis* Daudin, 1802:17 [Holotype.—MNHN 4868 from "Surinam;" Levaillant collector].
- Hyla elegans* Wied, 1824:671 [Holotype.—AMNH 784 from Ponte de Gentio, Rio Alcobaca, Caravelas, Bahia, Brasil; Maximillian A. P. Wied collector].
- Hyla leucophyllata*—Gravenhorst, 1829:31.
- Hypsiboas leucophyllatus*—Tschudi, 1838:72.
- Dendropsophus frontalis*—Fitzinger, 1843:31.
- Hyla leucophyllata*—Günther, 1859:112 (in part) [Synonymized *Hyla frontalis* and *Hyla elegans* with *Hyla leucophyllata*].
- Hyla leucophyllata*—Cochran, 1955:115 (in part) [Synonymized *Rana variegata* with *Hyla leucophyllata*].

The foregoing synonymy differs from those presented by Cochran (1955:115) and Cochran and Goin (1970:290) in that *Hyla triangulum* herein is considered to be a distinct species. Examination of the extant types (*H. elegans*, *frontalis*, and *leucophyllata*) reveals that each has a distinctive hour-glass-shaped dark brown dorsal mark on a creamy tan ground color. In the living *H. leucophyllata* that I have seen from Belém, Brasil, and from various localities in Amazonian Colombia, Ecuador, and Perú the dorsal blotch is dark brown, and usually the posterolateral corners are confluent with a broad brown stripe on the flanks. In most specimens one or two narrow transverse dark stripes are present on the shanks. The webbing, lower flanks, and hidden surfaces of the limbs are pale orange. Specimens from coastal Brasil (Bahia to São Paulo) lack transverse marking on the shanks. Lutz (1973:103) suggested that the coastal populations might be distinct from those in the Amazon Basin. If so, the name *Hyla elegans* is available for the coastal populations. However, at this time sufficient biological data to determine the relationships of the populations are lacking.

Hyla leucophyllata is widespread in lowland rainforests east of the Andes, occurring in the Amazon Basin from Colombia to Bolivia, eastward through Brasil to the Guianas, and on the coastal lowlands from Bahia to São Paulo, Brasil.

Hyla sarayacuensis Shreve

- Hyla leucophyllata sarayacuensis* Shreve, 1935:215 [Holotype.—MCZ 19729 from Sarayacu, Provincia Pastaza, Ecuador; O. C. Felton collector].
- Hyla sarayacuensis*—Goin, 1957a:60.

This is the most distinctive species in the group. The dorsum is pale chocolate brown with creamy white markings with irregular edges; the markings consist of a triangular blotch with the base on the eyelids and the apex lying anteriorly, diagonal marks in the scapular region, diagonal bars on the shanks, and spots on the heels.

In some individuals a pair of diagonal bars is present on the forearms. The webbing, lower flanks, and hidden surfaces of the limbs are pale pinkish orange at night, intensifying to deep orange-red by day.

Hyla sarayacuensis occurs in the upper Amazon Basin in southern Colombia, Ecuador, and Perú.

Hyla triangulum Günther

Hyla triangulum Günther, 1869:489 [Holotype.—BMNH 1947.2.23.88 from "Brasil"; collector unknown].

Hyla leucophyllata triangulum—Cope, 1870:155.

Hyla reticulata Jiménez de la Espada, 1871:61 [Holotype.—MNCN 329 from Río Napo, Provincia Napo, Ecuador; Marcos Jiménez de la Espada collector]. New synonym.

Hyla mimetica Melin, 1941:24 [Syntypes.—NHMG 469 (2 specimens) from Roque, Departamento San Martín, Perú; Douglas Melin collector]. New synonym.

Hyla membranacea Andersson, 1945:77 [Syntypes.—NHRM 1961 (4 specimens) from "Rio Pastaza watershed," Ecuador; William Clarke-MacIntyre collector]. New synonym.

Hyla laynei Goin, 1957a:61 [Holotype.—FSM 8503 from Leticia, Comisaría Amazonas, Colombia; J. N. Layne collector]. New synonym.

Hyla oliveae Cochran and Goin, 1970:304 [Holotype.—FSM 8555 from Leticia, Comisaría Amazonas, Colombia; J. N. Layne collector]. New synonym.

One of the most perplexing problems in hylid systematics in the upper Amazon Basin has been the identity of one or more species in the *Hyla leucophyllata* group having flash colors that are pink at night and red by day. At first, individuals with unmarked dorsums were called *H. membranacea*; those with spots over the entire dorsum were considered to be *H. reticulata*, and those with a row of spots middorsally were referred to as *H. laynei*. The acquisition of a huge series of adults from Limoncocha, Ecuador, provided the material for an analysis of variation in color pattern in one population (Fig. 3, Table 5). The different color morphs nearly form a continuum from plain to completely spotted individuals. All individuals having dorsal patterns 6 or 7, and 12 percent of those having pattern 5 have the dorsal surfaces of the shanks, the sides of the head, and the flanks spotted. In all others the sides of the head and flanks are uniform dark brown, and the dorsal surfaces of the shanks are yellowish tan.

Extensive field studies at Santa Cecilia, Ecuador, and less detailed observations at Leticia, Colombia, at Pilcopata, Perú, and at various localities in Amazonian Ecuador revealed no differences in habitat, calling sites, breeding sites, or tadpoles. Analysis of recordings of mating calls of males of the different morphs also revealed no differences. Thus, I conclude that all of the nominal taxa listed in the foregoing synonymy are based on different color morphs of one species (Table 6).

Cochran and Goin (1970:306) noted that in life the holotype of

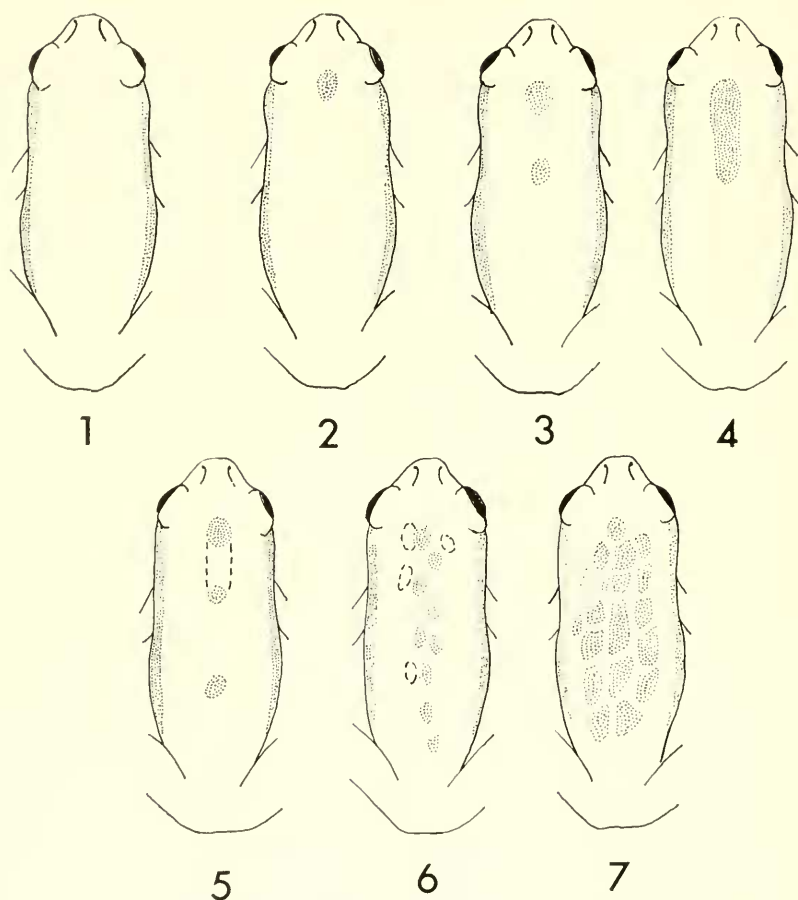


FIG. 3. Diagrammatic dorsal color pattern morphs 1-7 in *Hyla triangulum*. Variation included within one coded category by dashed lines.

Hyla oliveae was brown with small golden spots. Frogs of this species are capable of considerable metachrosis. I have observed the same pattern in several individuals of color morph 1; later they have changed to creamy tan or white. However, the brown spots do not appear and vanish, although they do change in intensity. The specimen labeled as *Hyla leucophyllata* illustrated by Cochran and Goin (1970:291) is *Hyla triangulum*.

This species is widespread in the middle and upper Amazon Basin in Brasil, Colombia, Ecuador, and Perú.

***Osteocephalus langsdorffii* (Duméril and Bibron)**

Hyla langsdorffii Duméril and Bibron, 1841:537 [Holotype.—MNHN 4634 from "Brasil"; N. Langsdorff, collector].

TABLE 5. Frequency of occurrence of color pattern morphs in *Hyla triangulum* from Limoncocha, Ecuador.

(Numbers are percentages; see Fig. 3 for color morphs)

Sex	N	1	2	3	4	5	6	7
♂♂	1135	54.4	14.6	4.4	5.7	4.9	14.2	1.8
♀♀	460	57.2	12.8	3.0	4.3	4.6	15.7	2.4
♂+♀	1595	55.3	14.1	4.0	5.3	4.8	14.6	1.9

TABLE 6. Comparison of type specimens of taxa referred to the synonymy of *Hyla triangulum*.

(See Fig. 3 for color morphs)

Name	Sex	Snout-vent Length	Color Morph
<i>H. laynei</i>	♂	25.6 mm	6
<i>H. membranacea</i>	♀	36.4 mm	1
<i>H. mimetica</i>	♀	23.5 mm	7
<i>H. olivaceae</i>	♂	23.6 mm	1
<i>H. reticulata</i>	♀	29.8 mm	7
<i>H. triangulum</i>	♀	26.5 mm	2

Hypsiboas langsdorffii—Fitzinger, 1843:30.*Osteocephalus langsdorffii*—Cope, 1867:200.*Hyla langsdorffii*—Boulenger, 1882:364.

Trueb and Duellman (1971) did not include *langsdorffii* in their review of *Osteocephalus*. Examination of the holotype, a few specimens from southeastern Brasil, and a skeleton generously provided by Avelino Barrio reveals that *langsdorffii* belongs in the genus *Osteocephalus*, as first suggested by Cope (1867:200) and recently intimated by Lutz (1973:31).

The numerical sequence in the following diagnosis is the same as that used by Trueb and Duellman (1971): 1) size large, sexual dimorphism moderate; maximum observed snout-vent length 70.7 mm in males, 88.9 mm in females [Lutz (1973:29) gave maximum lengths of 77 and 99 mm]; 2) skin or dorsum of males bearing small conical tubercles; 3) skin of flanks tubercular; 4) web extending to base of penultimate phalange of third finger; 5) dorsum olive-brown or greenish gray with irregular pattern of darker shades; 6) throat and chest white; belly and ventral surfaces of thighs yellowish orange; 7) lips unmarked; 8) flanks bluish gray; 9) dermal roofing bones of skull, exostosed and coossified; 10) dermal sphenethmoid present; 11) nasals juxtaposed medially; 12) anteromedial margins of frontoparietals at mid-level of orbits; 13) frontoparietal fontanelle covered; 14) palatine smooth; 15) parasphenoid lacking odontoids; 16) zygomatic ramus of squamosol extending one-half of distance to maxillary; 17) transverse processes of third presacral

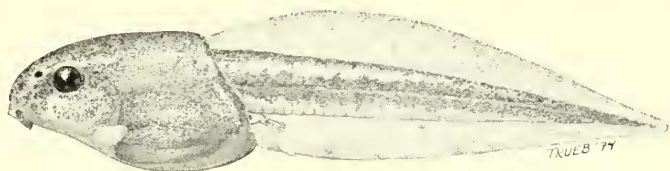


FIG. 4. Tadpole of *Osteocephalus langsdorffii*, KU 146853. $\times 2$.

vertebra approximately equal in width to sacral diapophyses; transverse processes of presacral vertebrae III-VIII subequal in width.

Osteocephalus langsdorffii can be distinguished from other members of the genus by the presence of scalloped dermal folds on the outer edges of the hands and feet, a row of tubercles on the posterior edge of the jaw, tubercles on the flanks, and white subanal folds.

Tadpoles from Guarujá, São Paulo, Brasil (KU 146853), provided by Werner C. A. Bokermann, have two upper and five lower rows of teeth, as do other known tadpoles of the genus, but instead of being uniformly black, the tadpoles are dark brown with cream dorsolateral and ventral stripes on the caudal musculature (Fig. 4).

Duméril and Bibron (1841:537) gave the type locality as Brasil; a label in the jar with the holotype gives "Cayenne." Lutz (1973:29) suggested that the type may have come from near Langsdorff's country home at the foot of the Serra da Estrela, on the way to Petrópolis, in the state of Rio de Janeiro. Most records for occurrence of this species are in the coastal region of southeastern Brasil (Guanabara, Rio de Janeiro, and São Paulo), but it is also known from the vicinity Iguazú Falls in Paraná, Brasil, and Misiones, Argentina.

Sphaenorhynchus carneus (Cope)

Hylella carnea Cope, 1868:111 [Holotype.—lost, from "Napo or upper Marañón (? Perú); James Orton collector].

Hyla carnea—Nieden, 1923:270.

Sphoerohyla habra Goin, 1957b:18 [Holotype.—FSM 8508 from Leticia, Comisaría Amazonas, Colombia; James N. Layne collector].

Hyla habra—Gorman, 1963:22.

Sphaenorhynchus habrus—Cochran and Goin, 1970:351.

Cope (1868:11) described, as *Hylella carnea*, a distinctively marked little frog having a snout-vent length of "9 lines" (=19 mm); he noted that the color in preservative was rose-yellow with blood red markings, consisting of marks on the shanks and forearms and broad canthal and dorsolateral stripes. Although some specimens from the Orton collection are extant in the Academy of Natural Sciences of Philadelphia and the United States National Museum, the holotype cannot be found.

Although Cope did not specifically state that the specimen lacked prevomerine teeth, he certainly implied the absence of teeth by

placing the species in *Hylella*, a genus recognized at that time as differing from *Hyla* by the absence of prevomerine teeth. Otherwise, the description could apply to *Hyla granosa* Boulenger, *H. punctata* (Schneider) or *H. rhodopepla* Günther (Duellman, 1972). In the upper Amazon Basin the only small green hylids lacking prevomerine teeth are the species of *Sphaenorhynchus*.

Goin (1957) named *Sphoehyla* (= *Sphaenorhynchus*) *habrus* from Leticia, Colombia, diagnosed by small size, absence of prevomerine teeth, and tympanum not apparent externally. I have collected this species in Amazonian Ecuador and have examined the type series and five specimens from Amazonian Perú. Study of these specimens, which have red canthal and dorsolateral stripes, and comparison of them with Cope's description reveals that Cope's description adequately fits this small species of *Sphaenorhynchus*. Thus, I conclude that *Sphoehyla habra* Goin, 1957, is a junior synonym of *Hylella carnea* Cope, 1868.

Twelve males have snout-vent lengths of 15.1-19.8 (\bar{x} =17.7) mm; three females, 19.0-22.5 (\bar{x} =20.2) mm. In dorsal view the snout is broadly rounded, nearly truncate; in lateral profile the tip of the snout is well beyond the margin of the lip. The canthus is rounded, and the nostrils are about four-fifths of the distance from the eye to the tip of the snout. In most specimens the anteroventral edge of the tympanum is visible. The fingers are about one-third webbed and the toes three-fourths webbed. The inner metatarsal tubercle is large, ovoid, and visible from above. Dermal folds on the limbs are absent. Males have horny nuptial excrescences on the pollices and a large, single, median vocal sac posteriorly on the throat.

Individuals at Santa Cecilia, Ecuador, were pale green dorsally with golden cream canthal and dorsolateral stripes at night; the vocal sacs were green, and the bellies white. By day, the dorsum changed to a dark green with reddish brown flecks and faint greenish cream dorsolateral and canthal stripes bordered below by reddish brown stripes. The belly was white, and other ventral surfaces were green; the axilla and groin were blue and the webbing unpigmented. The iris was pale silver and the bones were green. In preservative the dorsal ground color is cream. Red dorsal flecks and canthal stripes are evident on all specimens. The dorsolateral red stripe is faded in some but distinct in others. Red flecks or two or three transverse dashes are evident on the dorsal surface of shanks. In smaller individuals the green vertebral column is visible through the dorsal skin.

This species is now known in the upper Amazon Basin in Colombia, Ecuador, and northern Perú, where it is known in the drainages of the Río Napo and Río Ucayali, both tributaries of the Río Amazonas.

RESUMEN

Las investigaciones sobre la nomenclatura de varias especies de ranas neotropicales de la familia Hylidae arrojaron algunos cambios taxonómicos. Diecinueve nombres específicos se colocaron como sinónimos de otros once; tres nombres científicos se rescataron de sus sinónimos; tres nombres se transfirieron a otros géneros, y dos subespecies se asignaron a diferentes especies (Tabla 1).

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